UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,519	03/11/2004	John Sievers	199-0231US	7245

29855 7590 11/14/2008
WONG, CABELLO, LUTSCH, RUTHERFORD & BRUCCULERI, L.L.P.
20333 SH 249
SUITE 600
HOUSTON, TX 77070

EXAMINER	
FINDLEY, CHRISTOPHER G	

ART UNIT	PAPER NUMBER
2621	

MAIL DATE	DELIVERY MODE
11/14/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,519	SIEVERS ET AL.	
	Examiner	**Art Unit**	
	CHRISTOPHER FINDLEY	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 25 August 2008.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-33 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-33 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 8/25/2008 have been fully considered but they are not persuasive.

2. Re claims 1 and 15, the Applicant contends that the prior art cited fails to teach or suggest determining one or more processing capabilities of a decoder that will decode the video sequence. However, the Examiner respectfully disagrees. Brooks discloses that computing systems 120-140 and network appliance 180 typically have different processing power, display capabilities, memory, operating systems, and the like, and as a result of these differences, each system have different abilities to receive, process, and display video data (Brooks: column 6, lines 30-34; Fig. 1). Brooks also discloses several examples of processors with their associated video processing capabilities (Brooks: column 6, line 35-column 7, line 6). Accordingly, Brooks discloses that the data associated with the output video data is typically derived from the requesting device, and the requesting device will inform the gateway system as to the bandwidth requirements, whereas such requirements may include maximum frame rate, color-depth, screen resolution or spatial bandwidth, maximum bit rate, and the like (Brooks: column 10, lines 1-15).

3. Re claims 1 and 15, the Applicant also contends that the prior art cited fails to teach or suggest increasing video quality as a function of macroblocks that are skipped to take advantage of decoder processing capability that would otherwise be unused as a result of the skipped macroblocks. However, the Examiner respectfully disagrees.

Brooks discloses adjusting the quantization scale to meet an optimized target bitrate (Brooks: column 13, lines 57-64), But Brooks does not specifically disclose adjusting video quality as a function of macroblocks that are skipped to take advantage of decoder processing capability that would otherwise be unused as a result of the skipped macroblocks. However, Sekiguchi discloses a video data conversion device and method, wherein a coding mode estimator chooses a coding mode based on whether some data is intra data (intra mode), all data is skipped (skip mode), or any other combination of data (mode selected on a cost basis) (Sekiguchi: Fig. 7). Sekiguchi further explains, with reference to Fig. 7, that if all four macroblocks are intra mode, then the coding mode is forcedly made intra (Sekiguchi: paragraph [0127]); if all four macroblocks are the skip mode, then the coding mode is forcedly made skip (Sekiguchi: paragraph [0128]); but if an occasion other than skip takes place just once, then the possibility of inter mode is checked (Sekiguchi: paragraph [0128]). Accordingly, the coding mode includes three possible choices: forced intra mode, forced skip mode, and inter mode (Sekiguchi: paragraph [0129]; Fig. 2, step ST0). As a result, only when a decision is made that the possibility of the inter mode must be checked, the optimum mode in terms of the coding efficiency is redecided among the possible coding modes (Sekiguchi: paragraph [0130]), and the mode with the highest coding efficiency is selected (Sekiguchi: paragraph [0140]). Therefore, coding optimization is a function of the presence of skip macroblocks in an inter frame.

4. Re claims 22 and 27, the Applicant contends that theprior art cited fails to teach or suggest increasing video quality as a function of an encoder model of decoder

processing load. However, the Examiner respectfully disagrees. Brooks discloses that computing systems 120-140 and network appliance 180 typically have different processing power, display capabilities, memory, operating systems, and the like, and as a result of these differences, each system have different abilities to receive, process, and display video data (Brooks: column 6, lines 30-34; Fig. 1). Brooks also discloses several examples of processors with their associated video processing capabilities (Brooks: column 6, line 35-column 7, line 6). Accordingly, Brooks discloses that the data associated with the output video data is typically derived from the requesting device, and the requesting device will inform the gateway system as to the bandwidth requirements, whereas such requirements may include maximum frame rate, color-depth, screen resolution or spatial bandwidth, maximum bit rate, and the like (Brooks: column 10, lines 1-15). Therefore, the target bitrate for the encoder is derived as a function of a model of the decoding processor's capabilities.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 22-27 and 30-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Brooks et al. (US 7114174 B1).

Re **claim 22**, Brooks discloses a method of quality-improvement of a digitally-encoded video sequence, the method comprising: determining one or more processing capabilities of a decoder that will decode the video sequence (Brooks: Figs. 6A and 6B; column 10, lines 1-15); and increasing video quality as a function of an encoder model of decoder processing load to take advantage of decoder processing capability that would otherwise be unused (Brooks: Fig. 6A; column 3, lines 8-14).

Re **claim 23**, Brooks discloses that the step of determining one or more processing capabilities of a decoder comprises having prior knowledge of the decoder type (Brooks: column 10, lines 1-15, the data associated with the output video data is typically derived from the requesting device, and the requesting device will inform the gateway system as to the bandwidth requirements, whereas such requirements may include maximum frame rate, color-depth, screen resolution or spatial bandwidth, maximum bit rate, and the like).

Re **claim 24**, Brooks discloses that the step of determining one or more processing capabilities of the decoder comprises receiving processing capability information from the decoder (Brooks: column 3, lines 12-14, adaptation is made with respect to encoding format).

Re **claim 25**, Brooks discloses that the step of increasing video quality comprises increasing a video frame rate (Brooks: Fig. 6A, element 890).

Re **claim 26**, Brooks discloses that the step of increasing video quality comprises increasing a video picture size (Brooks: Fig. 6A, element 860).

Re **claim 27**, Brooks discloses a video encoder for generating an encoded video sequence, comprising: one or more image processing engines adapted to: encode a video signal (Brooks: Fig. 4, encoder 560); determine one or more processing capabilities of a decoder that will decode the encoded video sequence (Brooks: Figs. 6A and 6B; column 10, lines 1-15); and increase video quality as a function of an encoder model of decoder processing load to take advantage of decoder processing capability that would otherwise be unused (Brooks: Fig. 6A; column 3, lines 8-14).

Claim 30 has been analyzed and rejected with respect to claim 25 above.

Claim 31 has been analyzed and rejected with respect to claim 26 above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-21, 28-29, and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brooks et al. (US 7114174 B1) in view of Sekiguchi et al. (US 20050041740 A1).

Re **claim 1**, Brooks discloses a method of quality-improvement of a digitally-encoded video sequence, wherein the video sequence comprises information

representing a sequence of encoded frames, each encoded frame comprising one or more encoded macroblocks, the method comprising: determining one or more processing capabilities of a decoder that will decode the video sequence (Brooks: Fig. 6A, elements 810, 840, and 870; the video stream is manipulated to meet a target output color depth, resolution, and frame rate); encoding macroblocks of a first image (Brooks: Fig. 6B, element 930; the data is encoded); and adjusting video quality to meet target output parameters (Brooks: Fig. 6A; column 3, lines 8-14).

Brooks does not specifically disclose encoding macroblocks of subsequent images, wherein some macroblocks are skipped and determining a target video quality for the output stream as a function of a fraction of macroblocks that are skipped. However, Sekiguchi discloses a video data conversion method, where some macroblocks are skipped in the encoding process (Sekiguchi: Fig. 2, element ST0) and the coding mode is determined by analyzing a cost function if the frame is a mix of skipped blocks and non-skipped blocks (Sekiguchi: Fig. 7, coding mode estimator 8; paragraphs [0127]-[0130]). Since both Brooks and Sekiguchi relate to manipulating video data to meet output stream constraints, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the video data conversion of Sekiguchi with the quality manipulation of Brooks in order to provide a more robust encoder, which can hold up to the change in data used for motion estimation, which results from the change in resolution (Sekiguchi: paragraph [0010]). The combined method of Brooks and Sekiguchi has all of the features of claim 1.

Re **claim 2**, the combined method of Brooks and Sekiguchi discloses that the step of determining one or more processing capabilities of a decoder comprises having prior knowledge of the decoder type (Brooks: column 10, lines 1-15, the data associated with the output video data is typically derived from the requesting device, and the requesting device will inform the gateway system as to the bandwidth requirements, whereas such requirements may include maximum frame rate, color-depth, screen resolution or spatial bandwidth, maximum bit rate, and the like).

Re **claim 3**, the combined method of Brooks and Sekiguchi discloses that the step of determining one or more processing capabilities of the decoder comprises receiving processing capability information from the decoder (Brooks: column 3, lines 12-14, adaptation is made with respect to encoding format).

Re **claim 4**, the combined method of Brooks and Sekiguchi discloses a majority of the features of claim 4, as discussed above in claim 1. Brooks does not explicitly disclose that the step of determining one or more processing capabilities of the decoder comprises determining the number of macroblocks that can be decoded in a given interval if all macroblocks are skipped. However, Sekiguchi discloses a video data conversion device and method, wherein macroblocks conform to one of several coding modes (Sekiguchi: paragraph [0129], intra, skip, and inter modes) and the coding mode is selected based on a cost function (Sekiguchi: Fig. 7; paragraphs [0127]-[0130]). If an occasion other than skip takes place just once, then the possibility of inter mode is checked (Sekiguchi: paragraph [0128]) and the optimum mode in terms of the coding efficiency is redecided among the possible coding modes (Sekiguchi: paragraph

[0130]), thus resulting in highest coding efficiency being selected (Sekiguchi: paragraph [0140]). Since both Brooks and Sekiguchi relate to manipulating video data to meet output stream constraints, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the video data conversion of Sekiguchi with the quality manipulation of Brooks in order to provide a more robust encoder, which can hold up to the change in data used for motion estimation, which results from the change in resolution (Sekiguchi: paragraph [0010]).

Re **claim 5**, the combined method of Brooks and Sekiguchi discloses a majority of the features of claim 5, as discussed above in claims 1 and 4, but does not explicitly disclose that the step of increasing video quality comprises determining the maximum frame rate in accordance with the following expression:

$MaxFrameRate = \frac{1}{\frac{N_{coded}}{MaxMBPS} + \frac{N_{skipped}}{MaxSKIPPED}}$ where N_{coded} is the number of coded macroblocks per frame, $N_{skipped}$ is the number of skipped macroblocks per frame, MaxMBPS is the maximum number of macroblocks that can be decoded in a given interval, and MaxSKIPPED is the maximum number of macroblocks that can be decoded in a given interval if all macroblocks are skipped. However, The Examiner takes Official Notice that one of ordinary skill in the art at the time of the invention would have found it obvious to increase the frame rate of the video stream when less macroblocks are encoded in order to maintain a constant bitrate by transmitting more frames when less data is present in each frame.

Re **claim 6**, the combined method of Brooks and Sekiguchi discloses that the step of increasing video quality comprises increasing a video frame rate (Brooks: Fig. 6A, element 890).

Re **claim 7**, the combined method of Brooks and Sekiguchi discloses that the step of increasing video quality comprises increasing a video picture size (Brooks: Fig. 6A, element 860).

Re **claim 8**, the combined method of Brooks and Sekiguchi discloses a majority of the features of claim 8, as discussed above in claim 1. Additionally, Brooks discloses that the step of increasing video quality further comprises increasing a video frame rate (Brooks: Fig. 6A, element 890) as a function of a computational cost of the decoder to decode the macroblocks (Brooks: column 3, lines 15-21). Brooks does not explicitly state that various types of macroblocks are decoded. However, Sekiguchi discloses a video data conversion device and method, wherein macroblocks conform to one of several coding modes (Sekiguchi: paragraph [0129], intra, skip, and inter modes) and the coding mode is selected based on a cost function (Sekiguchi: Fig. 7; paragraphs [0127]-[0130]). Since both Brooks and Sekiguchi relate to manipulating video data to meet output stream constraints, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the video data conversion of Sekiguchi with the quality manipulation of Brooks in order to provide a more robust encoder, which can hold up to the change in data used for motion estimation, which results from the change in resolution (Sekiguchi: paragraph [0010]).

Re **claim 9**, the combined method of Brooks and Sekiguchi discloses a majority of the features of claim 9, as discussed above in claim 1. Additionally, Brooks discloses that the step of increasing video quality further comprises increasing a video picture size (Brooks: Fig. 6A, element 860) as a function of a computational cost of the decoder to decode the macroblocks (Brooks: column 3, lines 15-21). Brooks does not explicitly state that various types of macroblocks are decoded. However, Sekiguchi discloses a video data conversion device and method, wherein macroblocks conform to one of several coding modes (Sekiguchi: paragraph [0129], intra, skip, and inter modes) and the coding mode is selected based on a cost function (Sekiguchi: Fig. 7; paragraphs [0127]-[0130]). Since both Brooks and Sekiguchi relate to manipulating video data to meet output stream constraints, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the video data conversion of Sekiguchi with the quality manipulation of Brooks in order to provide a more robust encoder, which can hold up to the change in data used for motion estimation, which results from the change in resolution (Sekiguchi: paragraph [0010]).

Re **claim 10**, the combined method of Brooks and Sekiguchi discloses taking account of a number of coefficients included in the encoded macroblocks and a computational requirement of the decoder as a function of this number (Brooks: Fig. 6B, element 900; column 13, lines 57-64, varying the quantization scale changes the number of coefficients).

Claim 11 has been analyzed and rejected with respect to claim 6 above.

Claim 12 has been analyzed and rejected with respect to claim 7 above.

Claim 13 has been analyzed and rejected with respect to claim 8 above.

Claim 14 has been analyzed and rejected with respect to claim 9 above.

Re **claim 15**, Brooks discloses a method for manipulating video streams, which may be used in a video conferencing terminal (Brooks: column 3, lines 8-9, video streams are transformed) adapted to produce encoded video including a sequence of encoded frames, each encoded frame comprising one or more encoded macroblocks (Brooks: Fig. 6B, element 930; the data is encoded), the video conferencing terminal comprising: one or more image processing engines adapted to encode a video signal (Brooks: Fig. 4, encoder 560), and a communication interface adapted to determine one or more processing capabilities of a decoder that will decode the encoded video and further adapted to adjust video quality (Brooks: Figs. 6A and 6B; column 10, lines 1-15).

Brooks does not specifically disclose that some macroblocks are skipped and that video quality is adjusted to take advantage of decoder processing capability that would otherwise be unused as a result of the skipped macroblocks. However, Sekiguchi discloses a video data conversion method, where some macroblocks are skipped in the encoding process (Sekiguchi: Fig. 2, element ST0) and the coding mode is determined by analyzing a cost function if the frame is a mix of skipped blocks and non-skipped blocks (Sekiguchi: Fig. 7, coding mode estimator 8; paragraphs [0127]-[0130]). Since both Brooks and Sekiguchi relate to manipulating video data to meet output stream constraints, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the video data conversion of Sekiguchi with the quality manipulation of Brooks in order to provide a more robust encoder, which can

hold up to the change in data used for motion estimation, which results from the change in resolution (Sekiguchi: paragraph [0010]). The combined method of Brooks and Sekiguchi has all of the features of claim 15.

Claim 16 has been analyzed and rejected with respect to claim 4 above.

Claim 17 has been analyzed and rejected with respect to claim 5 above.

Claim 18 has been analyzed and rejected with respect to claim 6 above.

Claim 19 has been analyzed and rejected with respect to claim 7 above.

Claim 20 has been analyzed and rejected with respect to claim 8 above.

Claim 21 has been analyzed and rejected with respect to claim 9 above.

Claim 28 has been analyzed and rejected with respect to claim 4 above.

Claim 29 has been analyzed and rejected with respect to claim 5 above.

Claim 32 has been analyzed and rejected with respect to claim 8 above.

Claim 33 has been analyzed and rejected with respect to claim 9 above.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. Adaptable bitstream video delivery system

Vetro et al. (US 6490320 B1)

b. METHOD AND APPARATUS FOR MIXING COMPRESSED VIDEO

ESHKOLI et al. (US 20070120967 A1)

c. Transcoder

Christopoulos et al. (US 6526099 B1)

d. Apparatus and methods for improving video quality delivered to a display device

Baylon et al. (US 20030112366 A1)

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER FINDLEY whose telephone number is (571)270-1199. The examiner can normally be reached on Monday through Friday, 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Marsha D. Banks-Harold/
Supervisory Patent Examiner, Art Unit 2621
/Christopher Findley/